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June Lake Public Utility District
Water Resource Assessment

Technical Memorandum No. 2
Rodeo Grounds Water Demands

Prepared for:
Mono County Community
Development Department

June 2006

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JUNE LAKE PUBLIC UTILITY DISTRICT WATER RESOURCE ASSESSMENT
TECHNICAL MEMORANDUM NO. 2

Rodeo Grounds Water Demands

Prepared For: Mono County Community Development Department

Prepared By: Catherine Hansford

Reviewed By: John Enloe, P.E.
Lisa Haldane, P.E.

Date: June 5, 2006

PURPOSE AND SCOPE

The purpose of this subtask is to provide a projection of water demand generated by the proposed Intrawest Rodeo Grounds development in June Lake. This projection is based on water demand factors developed under Subtask A.1 in consultation with Mono County Community Development Department (Mono County CDD) and June Lake Public Utility District (JLPUD).

ORGANIZATION OF THIS REPORT

This memo is organized into the following major sections:

- Introduction
- Summary of Rodeo Grounds Projected Water Demand
- Discussion

INTRODUCTION

This memo and data contained within have been prepared as part of the June Lake Water Assessment for the proposed Rodeo Grounds development in compliance with California Senate Bills 610 and 221. As noted in the JLPUD Master Water Plan (The Master Water Plan), August 2004, total estimated future water demand for the PUD's Village System may be heavily influenced by the projected water demand for the proposed Rodeo Grounds development.

The Master Water Plan projects future water demand for JLPUD by remaining developable acreage in the district's territory with the exception of the Rodeo Grounds, which is projected using a gallons per capita per day approach. It was assumed the average day demand for visitors would be 75 gallons per capita per day (gpcd) and 100 gpcd for permanent residents. Using an occupancy factor of 3 persons per unit, the Master Water Plan estimated an average day Rodeo Grounds water usage potential of 226,000 gallons, or an annual demand of 82.5 million gallons. Potential water demand of this magnitude is significant to JLPUD as it would increase the existing total average day demand in the Village System by approximately 50%.

SB610 requires an assessment of whether projected supply for the next 20 years will meet projected demand for the next 20 years for the proposed project area, existing and planned future uses. At this time it is premature to show demand 20 years from the project start because insufficient information has been supplied regarding market absorption of the development area. This analysis must be conducted when relevant information becomes available.

The greatest annual changes are anticipated to occur during the first five years of development, largely due to changing landscaping water needs. During the first year of planting, landscaping requires its greatest water application to get the plants established. By the fifth year, landscaping should be using a consistent annual water demand. Occupancy rates in the hotel/condo (including commercial space) and condominium products will increase during the initial years of development. No information is available at this time whether the single family homes will be developer-built or custom built, or what their absorption and/or occupancy rates will be. *For purposes of this initial water demand analysis, projected water demands are on an annual basis for year five of development onwards, which assumes established landscaping water needs and absorption of all residential units and commercial square footage.*

SUMMARY OF RODEO GROUNDS PROJECTED WATER DEMAND

Based on the research and recommendations in Technical Memorandum Subtask A.1, total annual water demand for the Rodeo Grounds is projected to be 33.37 million gallons per year. Table 1 shows total annual water demand by water customer, and the percentage of total Rodeo Grounds water demand by water customer. Over half of the total annual water demand is projected to be generated by single family and affordable housing. Approximately 33% is projected to be generated by the hotel/condo and condominium water customers. Irrigation in the Resort Area comprises approximately 9% of annual water demand. Irrigation numbers were provided by Intrawest's landscape architect for the project area. These numbers will be peer reviewed before the initial water demand projections are finalized.

Table 1
Mono County - June Lake Water Assessment
Rodeo Grounds Annual Demand Summary by Water Customer

Area	Annual Demand (Millions of Gallons)	Percent of Annual Demand
Hotel / Condo	9.00	27%
Condominium	2.08	6%
Non-resident single family	15.31	46%
Resident single family	2.94	9%
Resident multi-family	0.98	3%
Resort Area Irrigation	3.07	9%
Total Annual Water Demand	**33.37**	**100%**

Table 2 shows annual water demand by development area in the Rodeo Grounds project. Greatest demand (47%) is projected to be generated by the resort center. Area 2 generates approximately 24% of the total demand, and Areas 3, 4, and 5 generate the remaining 29% of annual water demand.

Table 2
Mono County - June Lake Water Assessment
Rodeo Grounds Annual Demand Summary by Area

Area	Annual Demand (Millions of Gallons)	Percent of Annual Demand
Area 1 (Resort Center)	15.62	47%
Area 2	8.14	24%
Area 3	3.68	11%
Area 4	3.48	10%
Area 5	2.46	7%
Total Annual Water Demand	**33.37**	**100%**

The Master Water Plan, Table 6, page 12 shows projected build-out Village System water demand of 260,250 gallons per day, and Down Canyon water system demand of 417,956 gallons per day. In this memorandum it is assumed that all Rodeo Grounds water demand will be served from the Village System. This information is summarized in Table 3.

Table 3
JLPUD Estimated Build-out Water Demand
(million gallons/year)

	Existing Demand (12-yr avg)[1]	Rodeo Grounds Area	Remainder of Service Area[2]	Total Estimated Build-out
Village System	55.48	33.37	39.51	128.36
Down Canyon System	67.53		85.02	152.55
Total JLPUD		33.37		280.92

[1] 2004 Water Master Plan Update, August 2004, Boyle Engineering Corporation, Table 5
[2] Ibid. Table 6

DISCUSSION

The water demand factors to be confirmed by Mono CDD and JLPUD are shown in Table 4. Peak winter hotel/condo occupancy is shown January through March at approximately 4,500 gallons per unit per month compared to monthly average demand of approximately 3,000 gallons per unit. Condominium usage stays fairly consistent throughout the year with a monthly average demand of about 2,400 gallons per unit, with a decrease during the fall to about 1,100 gallons per unit. Average monthly usage by resident single family units is 10,200 gallons, which is almost double the non-resident unit usage of 5,300 gallons. The greatest difference in water usage between resident and non-resident single family units is during the summer irrigation months. During July, a resident home is projected to demand 20,500 gallons, whereas a non-resident home is projected to demand 9,400 gallons. Multi-family has almost the same monthly winter peak and summer peak water demand factors, at 4,500 gallons and 4,600 gallons per unit respectively.

Table 5 shows monthly water demand projection by water customer using the monthly per unit demand factors given in Table 4. Annual water demand for hotel/condo is approximately 7.5 million gallons, condominium 1.7 million gallons, non-resident single family 12.8 million gallons, resident single family 2.5 million gallons, and multi-family 0.8 million gallons. Resort Area irrigation, which only occurs mid-May through mid-October totals 2.6 million gallons. In addition to water demand generated by landscaping and occupants of buildings, total water demand for the project must take account of water system losses and unaccounted for water that is treated but does not reach the customer. A detailed analysis of water losses in the JLPUD system has not been performed. JLPUD was informed that water losses in the Mammoth Community Water District (Mammoth CWD) system for the 2004/2005 period was 17%. For the purposes of the current demand

projection, the JLPUD recommends a 20% water loss factor be applied to base demands. This is because the JLPUD water infrastructure is older than that of the Mammoth CWD, and will likely experience higher losses. The estimated loss for JLPUD is 5.5 million gallons per year (Table 5).

Figure 1 illustrates the annual pattern of water use by water customer. For purposes of this graph, the water loss is included in total monthly use by water customer. Irrigation accounts for summer peak usage. Non-resident single family usage accounts for almost half of all water usage.

Table 6 shows monthly water demand projection by proposed Rodeo Grounds development area. Annual water demand for the resort center (Area 1) is projected to generate almost half the total water demand at approximately 13.0 million gallons including irrigation demands. The estimated water system loss of 5.5 million gallons per year is shown at the bottom of the table. Figure 2 shows total monthly projected Rodeo Grounds water use by development area. For purposes of this graph, the water loss is included in total monthly use by development area. Projected peak usage months are June through September due to irrigation. January is projected to be the peak winter month and April and November are projected to have lowest water demand.

Table 4 – Water Demand Factors for Rodeo Grounds Water Demand Projection

Mono County - June Lake Water Assessment
Water Demand Factors for Rodeo Grounds Water Demand Projection

	Water Demand Factors by Month													
Water Customer Classification	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual Demand Factors	Average Monthly Demand Factors
Hotel / Condo														
Gallons per Unit per Month	3,376	4,479	4,309	4,486	2,904	1,926	2,098	3,135	3,234	2,753	2,310	2,559	37,570	3,131
Gallons per Unit per Day	109	144	154	145	97	62	70	101	104	92	75	85		
Condominium														
Gallons per Unit per Month	2,110	3,090	2,586	3,013	3,026	1,789	2,547	2,645	2,743	2,470	1,054	2,023	29,095	2,425
Gallons per Unit per Day	68	100	92	97	101	58	85	85	88	82	34	67		
Non-resident single family														
Gallons per Unit per Month	4,356	4,342	3,351	2,600	2,920	5,542	9,059	9,385	8,021	6,788	5,239	2,369	63,972	5,331
Gallons per Unit per Day	141	140	120	84	97	179	302	303	259	226	169	79		
Resident single family														
Gallons per Unit per Month	8,405	5,015	5,038	4,938	5,215	10,475	15,648	20,527	15,207	13,955	10,505	7,567	122,496	10,208
Gallons per Unit per Day	271	162	180	159	174	338	522	662	491	465	339	252		
Resident multi-family														
Gallons per Unit per Month	3,281	4,265	4,182	4,525	2,186	2,411	3,204	4,002	4,629	3,447	2,537	2,129	40,799	3,400
Gallons per Unit per Day	106	138	149	146	73	78	107	129	149	115	82	71		

Table 5 – Rodeo Grounds Water Demand Projection in Gallons

Mono County - June Lake Water Assessment
Rodeo Grounds Water Demand Projection in Gallons (unless otherwise noted)

Water Customer Classification	Number of Units	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	**Annual Demand**	**Average Monthly Demand**
Hotel / Condo	*demand factor*	*3,376*	*4,479*	*4,309*	*4,486*	*2,904*	*1,926*	*2,098*	*3,135*	*3,234*	*2,753*	*2,310*	*2,559*	***37,570***	3,131
Area 1 - Building A	93	314,509	417,282	401,381	417,934	270,564	179,413	195,450	292,094	301,281	256,497	215,173	238,414	**3,499,991**	291,666
Area 1 - Building B	47	159,550	211,687	203,620	212,017	137,257	91,016	99,152	148,179	152,840	130,121	109,157	120,947	**1,775,543**	147,962
Area 1 - Building C	59	199,725	264,989	254,892	265,403	171,818	113,934	124,118	185,490	191,325	162,885	136,643	151,401	**2,222,622**	185,219
Subtotal Hotel / Condominium	200	673,783	893,957	859,893	895,354	579,638	384,363	418,720	625,763	645,446	549,503	460,973	510,762	**7,498,157**	624,846
Condominium	*demand factor*	*2,110*	*3,090*	*2,586*	*3,013*	*3,026*	*1,789*	*2,547*	*2,645*	*2,743*	*2,470*	*1,054*	*2,023*	***29,095***	2,425
Area 1 - Building D	14	29,420	43,068	36,050	41,998	42,176	24,932	35,499	36,868	38,237	34,432	14,698	28,199	**405,578**	33,798
Area 1 - Building E	16	34,802	50,946	42,644	49,681	49,892	29,493	41,993	43,612	45,231	40,731	17,387	33,358	**479,769**	39,981
Area 1 - Building F	17	35,878	52,522	43,963	51,217	51,435	30,405	43,292	44,961	46,630	41,991	17,925	34,389	**494,608**	41,217
Area 1 - Building H	12	25,832	37,816	31,653	36,877	37,033	21,892	31,170	32,372	33,574	30,233	12,906	24,760	**356,117**	29,676
Subtotal Condominium	60	125,933	184,351	154,311	179,773	180,536	106,723	151,954	157,812	163,671	147,387	62,915	120,706	**1,736,072**	144,673
Non-resident single family	*demand factor*	*4,356*	*4,342*	*3,351*	*2,600*	*2,920*	*5,542*	*9,059*	*9,385*	*8,021*	*6,788*	*5,239*	*2,369*	***63,972***	5,331
Area 1 - Duplex	6	27,772	27,683	21,361	16,574	18,614	35,328	57,750	59,830	51,133	43,271	33,402	15,103	**407,822**	33,985
Area 2 - Single Family	18	78,416	78,164	60,312	46,798	52,557	99,751	163,060	168,932	144,376	122,178	94,311	42,643	**1,151,498**	95,958
Area 2 - Duplex	44	191,683	191,068	147,430	114,396	128,472	243,836	398,591	412,944	352,918	298,658	230,537	104,238	**2,814,772**	234,564
Area 2 - Fourplex	44	191,683	191,068	147,430	114,396	128,472	243,836	398,591	412,944	352,918	298,658	230,537	104,238	**2,814,772**	234,564
Area 3 - Single Family	48	209,109	208,438	160,833	124,796	140,152	266,003	434,826	450,484	385,001	325,808	251,495	113,714	**3,070,660**	255,888
Area 4 - Single Family	7	30,495	30,397	23,455	18,199	20,439	38,792	63,412	65,696	56,146	47,514	36,676	16,583	**447,805**	37,317
Area 5 - Single Family	32	139,406	138,959	107,222	83,197	93,434	177,335	289,884	300,323	256,668	217,206	167,663	75,810	**2,047,107**	170,592
Subtotal Non-resident single family	199	868,563	865,779	668,044	518,358	582,141	1,104,881	1,806,114	1,871,152	1,599,159	1,353,292	1,044,622	472,330	**12,754,435**	1,062,870
Resident single family	*demand factor*	*8,405*	*5,015*	*5,038*	*4,938*	*5,215*	*10,475*	*15,648*	*20,527*	*15,207*	*13,955*	*10,505*	*7,567*	*122,496*	10,208
Area 4 - Affordable Housing	20	168,097	100,310	100,750	98,769	104,296	209,497	312,957	410,548	304,145	279,099	210,105	151,347	**2,449,920**	204,160
Resident multi-family	*demand factor*	*3,281*	*4,265*	*4,182*	*4,525*	*2,186*	*2,411*	*3,204*	*4,002*	*4,629*	*3,447*	*2,537*	*2,129*	***40,799***	3,400
Area 1 - Affordable Housing	20	65,620	85,296	83,638	90,501	43,724	48,224	64,089	80,038	92,577	68,946	50,748	42,583	**815,982**	67,999
Total Water Demand in Gallons	**499**	**1,901,997**	**2,129,692**	**1,866,635**	**1,782,756**	**1,490,334**	**1,853,688**	**2,753,833**	**3,145,313**	**2,804,998**	**2,398,227**	**1,829,363**	**1,297,728**	**25,254,566**	2,104,547
Area 1 Irrigation [1]															
Zone A		-	-	-	-	-	70,918	170,203	190,833	172,781	121,205	34,814	-	**760,754**	63,396
Zone B		-	-	-	-	-	149,942	359,861	403,481	365,314	256,265	73,608	-	**1,608,471**	134,039
Zone C		-	-	-	-	-	17,364	41,674	46,725	42,305	29,677	8,524	-	**186,269**	15,522
Subtotal Area 1 Irrigation		-	-	-	-	-	238,224	571,738	641,039	580,400	407,147	116,946	-	**2,555,494**	212,957.83
Subtotal Water Demand in Gallons		**1,901,997**	**2,129,692**	**1,866,635**	**1,782,756**	**1,490,334**	**2,091,912**	**3,325,571**	**3,786,352**	**3,385,398**	**2,805,374**	**1,946,309**	**1,297,728**	**27,810,060**	2,317,505
Estimate for System Loss	20%	380,399	425,938	373,327	356,551	298,067	418,382	665,114	757,270	677,080	561,075	389,262	259,546	5,562,012	463,501
Total Water Demand in Gallons		**2,282,397**	**2,555,631**	**2,239,962**	**2,139,307**	**1,788,401**	**2,510,294**	**3,990,686**	**4,543,623**	**4,062,478**	**3,366,449**	**2,335,571**	**1,557,274**	**33,372,072**	**2,781,006**
Total Water Demand Millions of Gallons		**2.28**	**2.56**	**2.24**	**2.14**	**1.79**	**2.51**	**3.99**	**4.54**	**4.06**	**3.37**	**2.34**	**1.56**	**33.37**	2.78

Table 6 – Rodeo Grounds Water Demand by Area in Gallons

Mono County - June Lake Water Assessment
Rodeo Grounds Water Demand by Area in Gallons (unless otherwise noted)

Area	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual Demand	Average Monthly Demand
Area 1 (Resort Center)														
Building A	314,509	417,282	401,381	417,934	270,564	179,413	195,450	292,094	301,281	256,497	215,173	238,414	3,499,991	291,666
Building B	159,550	211,687	203,620	212,017	137,257	91,016	99,152	148,179	152,840	130,121	109,157	120,947	1,775,543	147,962
Building C	199,725	264,989	254,892	265,403	171,818	113,934	124,118	185,490	191,325	162,885	136,643	151,401	2,222,622	185,219
Building D	29,420	43,068	36,050	41,998	42,176	24,932	35,499	36,868	38,237	34,432	14,698	28,199	405,578	33,798
Building E	34,802	50,946	42,644	49,681	49,892	29,493	41,993	43,612	45,231	40,731	17,387	33,358	479,769	39,981
Building F	35,878	52,522	43,963	51,217	51,435	30,405	43,292	44,961	46,630	41,991	17,925	34,389	494,608	41,217
Building G	27,772	27,683	21,361	16,574	18,614	35,328	57,750	59,830	51,133	43,271	33,402	15,103	407,822	33,985
Building H	25,832	37,816	31,653	36,877	37,033	21,892	31,170	32,372	33,574	30,233	12,906	24,760	356,117	29,676
Affordable	65,620	85,296	83,638	90,501	43,724	48,224	64,089	80,038	92,577	68,946	50,748	42,583	815,982	67,999
Commercial													-	-
Irrigation	-	-	-	-	-	238,224	571,738	641,039	580,400	407,147	116,946	-	2,555,494	212,958
Subtotal Area 1	**893,109**	**1,191,287**	**1,119,202**	**1,182,203**	**822,512**	**812,862**	**1,264,251**	**1,564,482**	**1,533,227**	**1,216,255**	**724,984**	**689,154**	**13,013,528**	**1,084,461**
Area 2														
Single Family	78,416	78,164	60,312	46,798	52,557	99,751	163,060	168,932	144,376	122,178	94,311	42,643	1,151,498	95,958
Duplex	191,683	191,068	147,430	114,396	128,472	243,836	398,591	412,944	352,918	298,658	230,537	104,238	2,814,772	234,564
Fourplex	191,683	191,068	147,430	114,396	128,472	243,836	398,591	412,944	352,918	298,658	230,537	104,238	2,814,772	234,564
Subtotal Area 2	**461,782**	**460,301**	**355,173**	**275,591**	**309,502**	**587,423**	**960,241**	**994,819**	**850,211**	**719,493**	**555,385**	**251,119**	**6,781,041**	**565,087**
Area 3														
Single Family	**209,109**	**208,438**	**160,833**	**124,796**	**140,152**	**266,003**	**434,826**	**450,484**	**385,001**	**325,808**	**251,495**	**113,714**	**3,070,660**	**255,888**
Area 4														
Single Family	30,495	30,397	23,455	18,199	20,439	38,792	63,412	65,696	56,146	47,514	36,676	16,583	447,805	37,317
Affordable	168,097	100,310	100,750	98,769	104,296	209,497	312,957	410,548	304,145	279,099	210,105	151,347	2,449,920	204,160
Subtotal Area 4	**198,592**	**130,707**	**124,205**	**116,969**	**124,734**	**248,289**	**376,369**	**476,244**	**360,291**	**326,613**	**246,781**	**167,931**	**2,897,725**	**241,477**
Area 5														
Single Family	**139,406**	**138,959**	**107,222**	**83,197**	**93,434**	**177,335**	**289,884**	**300,323**	**256,668**	**217,206**	**167,663**	**75,810**	**2,047,107**	**170,592**
Subtotal Water Demand in Gallons	**1,901,997**	**2,129,692**	**1,866,635**	**1,782,756**	**1,490,334**	**2,091,912**	**3,325,571**	**3,786,352**	**3,385,398**	**2,805,374**	**1,946,309**	**1,297,728**	**27,810,060**	**2,317,505**
Estimate for System Loss at 20%	380,399	425,938	373,327	356,551	298,067	418,382	665,114	757,270	677,080	561,075	389,262	259,546	5,562,012	463,501
Total Water Demand in Gallons	**2,282,397**	**2,555,631**	**2,239,962**	**2,139,307**	**1,788,401**	**2,510,294**	**3,990,686**	**4,543,623**	**4,062,478**	**3,366,449**	**2,335,571**	**1,557,274**	**33,372,072**	**2,781,006**
Total Water Demand Millions of Gallons	**2.28**	**2.56**	**2.24**	**2.14**	**1.79**	**2.51**	**3.99**	**4.54**	**4.06**	**3.37**	**2.34**	**1.56**	**33.37**	2.78

Figure 1

Rodeo Grounds Water Demand Projection by Water Customer

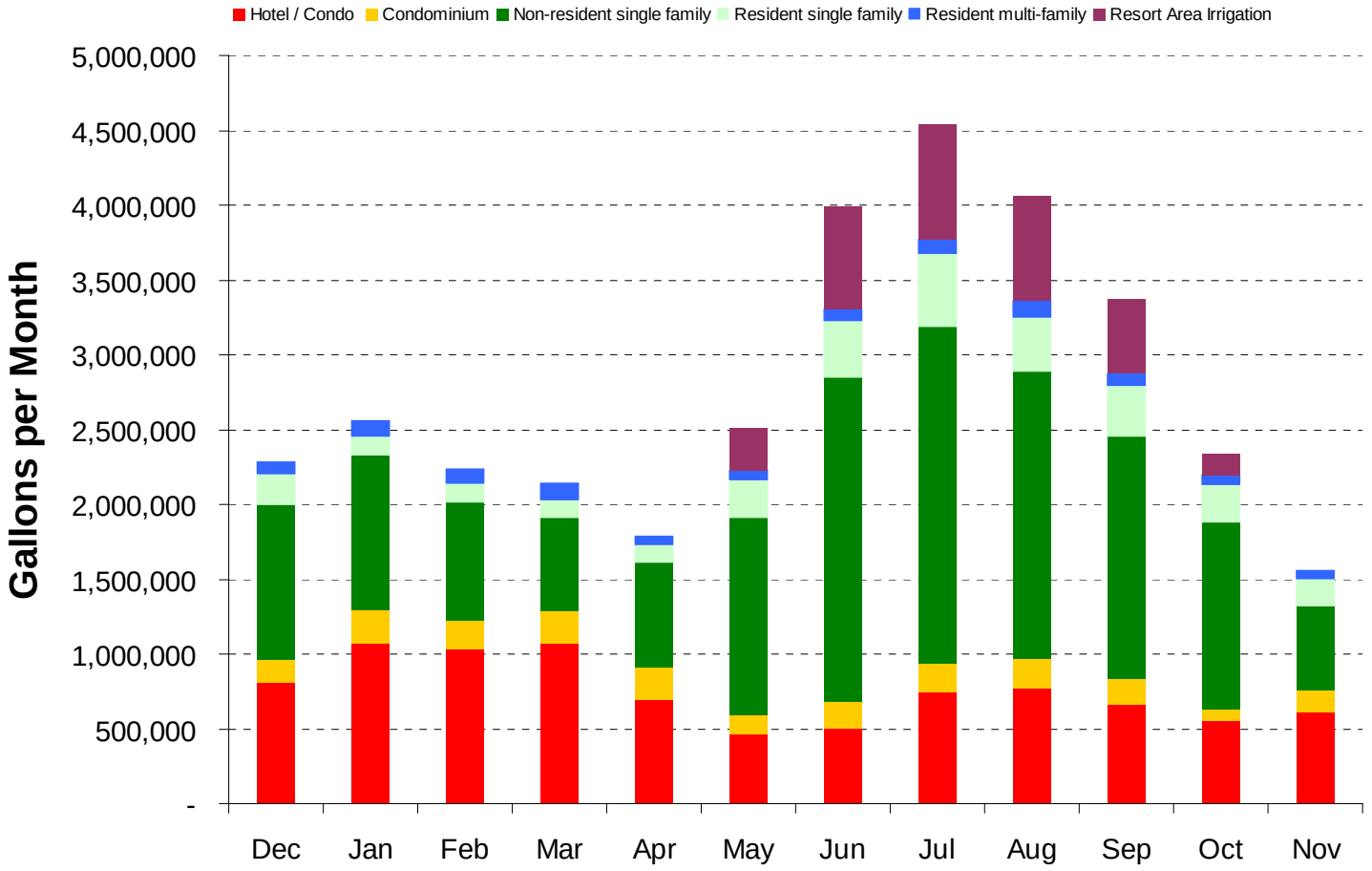

Figure 2

Rodeo Grounds Water Demand Projection by Area